

LISTING OF THE CLAIMS:

Claim 1 (Currently Amended) A process of producing a xylose solution from a biomass hydrolysate ~~or a part thereof, characterized by~~ of a xylan-containing vegetable material comprising subjecting said biomass hydrolysate to nanofiltration and recovering ~~as the~~ a nanofiltration permeate a solution enriched in xylose.

Claim 2 (Currently Amended) A process as claimed in claim 1, ~~characterized by~~ comprising recovering ~~as the~~ a retentate a solution including lignosulphonates, oligosaccharides, hexose sugars and divalent salts.

Claim 3 (Currently Amended) A process as claimed in claim 1 ~~or 2, characterized~~ by recovering ~~as the~~ a nanofiltration permeate a xylose solution having a xylose content of over 1.1 times, ~~preferably over 1.5 times, most preferably over 2.5 times~~ that of the ~~starting biomass hydrolysate, based on the~~ dry substance content.

Claim 4 (Currently Amended) A process as claimed in claim 3, ~~characterized by~~ comprising recovering a xylose solution having a xylose content of ~~or over~~ 1.5 to 2.5 times that of the ~~starting biomass hydrolysate, based on the~~ dry substance content.

Claim 5 (Currently Amended) A process as claimed in ~~any one of the preceding~~ claims, characterized in that claim 1, wherein the dry substance content of the starting biomass hydrolysate has a dry substance content of is 3 to 50 % by weight, ~~preferably 8 to 25 % by weight.~~

Claim 6 (Currently Amended) A process as claimed in claim 1, ~~any one of the preceding claims, characterized in that the dry substance content of wherein~~ the starting biomass hydrolysate used as the nanofiltration feed is has a dry substance content of less than 30% by weight.

Claim 7 (Currently Amended) A process as claimed in ~~any one of the preceding claims, characterized in that~~ claim 1, wherein the biomass hydrolysate has a xylose content of 5 to 95 %, preferably 15 to 55 %, more preferably 15 to 40 % and especially 8 to 27 % by weight, based on the dry substance content.

Claim 8 (Currently Amended) A process as claimed in ~~any one of the preceding claims, characterized in that~~ claim 1, wherein the biomass hydrolysate of xylan-containing vegetable material is a spent liquor obtained from a pulping process.

Claim 9 (Currently Amended) A process as claimed in claim 8, ~~characterized in that~~ wherein the spent liquor obtained from a pulping process is a spent sulphite pulping liquor.

Claim 10 (Currently Amended) A process as claimed in claim 9, ~~characterized in that~~ wherein the spent sulphite pulping liquor is an acid spent sulphite pulping liquor.

Claim 11 (Currently Amended) A process as claimed in claim 9 ~~or 10~~,
~~characterized in that~~ wherein the spent sulphite pulping liquor is obtained from hardwood
sulphite pulping.

Claim 12 (Cancelled)

Claim 13 (Cancelled)

Claim 14 (Currently Amended) A process as claimed in claim 8, ~~characterized in~~
~~that~~ wherein the spent liquor is a mother liquor obtained from the crystallization of
xylose.

Claim 15 (Currently Amended) A process as claimed in ~~any one of the preceding~~
~~claims, characterized in that~~ claim 1, wherein the nanofiltration is carried out at a pH of 1
to 7, ~~preferably 3 to 6.5, most preferably 5 to 6.5.~~

Claim 16 (Currently Amended) A process as claimed in ~~any one of the preceding~~
~~claims, characterized in that~~ claim 1, wherein the nanofiltration is carried out at a
pressure of 10 to 50 bar, ~~preferably 15 to 35 bar.~~

Claim 17 (Currently Amended) A process as claimed in ~~any one of the preceding~~
~~claims, characterized in that~~ claim 1, wherein the nanofiltration is carried out at a
temperature of 5 - 95 °C, ~~preferably 30 to 60 °C.~~

Claim 18 (Currently Amended) A process as claimed in ~~any one of the preceding claims, characterized in that~~ claim 1, wherein the nanofiltration is carried out with a flux of 10 to 100 liters/m²h.

Claim 19 (Currently Amended) A process as claimed in ~~any one of the preceding claims, characterized in that~~ claim 1, wherein the nanofiltration is carried out using a nanofiltration membrane selected from polymeric and inorganic membranes having a cut-off size of 100 to 2500 g/mol.

Claim 20 (Currently Amended) A process as claimed in claim 19, ~~characterized in that~~ wherein the cut-off size of the nanofiltration membrane is 150 to 1000 g/mol.

Claim 21 (Currently Amended) A process as claimed in claim 20, ~~characterized in that~~ wherein the cut-off size of the nanofiltration membrane is 150 to 500 g/mol.

Claim 22 (Currently Amended) A process as claimed in ~~any one of claims 12 to 21~~ claim 19, characterized in that wherein the nanofiltration membrane is selected from ionic membranes.

Claim 23 (Currently Amended) A process as claimed in ~~any one of claims 19 to 21, characterized in that~~ claim 19, wherein the nanofiltration membrane is selected from hydrophobic and hydrophilic membranes.

Claim 24 (Currently Amended) A process as claimed in ~~any one of claims 19 to 23, characterized in that~~ claim 19, wherein the nanofiltration membrane is selected from cellulose acetate membranes, polyethersulfone membranes, sulfonated polyether sulphone membranes, polyester membranes, polysulfone membranes, aromatic polyamide membranes, polyvinyl alcohol membranes and polypiperazine membranes and combinations thereof.

Claim 25 (Currently Amended) A process as claimed in claim 24, ~~characterized in that~~ wherein the nanofiltration membrane is selected from sulfonated polyether sulfone membranes and polypiperazine membranes.

Claim 26 (Currently Amended) A process as claimed in claim 24 ~~or 25, characterized in that~~ wherein the nanofiltration membrane is selected from NF-200 and Desal-5 DK membranes a polypiperazine membrane having a cut-off size of 200 g/mol, a permeability at 25°C of 7-8 l/(m²h bar) and a NaCl retention of 70 %, and a polyester-polysulfone membrane having a cut-off size of 150 to 300 g/mol, a permeability at 25°C of 5.4 l/(m²h bar) and a MgSO₄ retention of 98% at 2 g/l.

Claim 27 (Currently Amended) A process as claimed in ~~any one of claim~~ [[s]] 19 to 26, characterized that the form of wherein the nanofiltration membrane is has a form selected from sheets, tubes, spiral membranes and hollow fibers.

Claim 28 (Currently Amended) A process as claimed in ~~any one of claim[[s]] 19 to 27~~, ~~characterized in that~~ wherein the nanofiltration membrane is selected from high shear type membranes.

Claim 29 (Currently Amended) A process as claimed in ~~any one of claim[[s]] 19 to 28~~, ~~characterized in that~~ wherein the nanofiltration membrane has been pretreated by washing.

Claim 30 (Currently Amended) A process as claimed in claim 29, ~~characterized in that~~ wherein the washing includes a the washing agent is selected from ethanol, ~~and/or~~ an alkaline detergent, or a combination thereof.

Claim 31 (Currently Amended) A process as claimed in ~~any one of the preceding claims~~, ~~characterized in that~~ claim 1, wherein the nanofiltration process is repeated at least once.

Claim 32 (Currently Amended) A process as claimed in ~~any one of the preceding claims~~, ~~characterized in that~~ claim 1, wherein the process is carried out batchwise or continuously.

Claim 33 (Currently Amended) A process as claimed in ~~any one of the preceding claims~~, ~~characterized in that~~ claim 1, wherein the process is carried out using a

nanofiltration equipment including several nanofiltration elements arranged in parallel or series.

Claim 34 (Currently Amended) A process as claimed in ~~any one of the preceding claims, characterized in that the process also comprises~~ claim 1, further comprising one or more pretreatment steps.

Claim 35 (Currently Amended) A process as claimed in claim 34, ~~characterized in that~~ wherein the one or more pretreatment steps are selected from ion exchange, ultrafiltration, chromatography, concentration, pH adjustment, filtration, dilution, crystallization and combinations thereof.

Claim 36 (Currently Amended) A process as claimed in ~~any one of the preceding claims, characterized in that the process also comprises~~ claim 1, further comprising one or more post-treatment steps.

Claim 37 (Currently Amended) A process as claimed in claim 36, ~~characterized in that~~ wherein the one or more post-treatment steps are selected from ion exchange, crystallization, chromatography, concentration, reverse osmosis and ~~colour~~ color removal.

Claim 38 (Currently Amended) A process as claimed in claim 36, ~~characterized in that the process comprises reduction as a~~ wherein the one or more post-treatment steps includes a reduction step which converts to convert xylose to xylitol.

Claim 39 (Currently Amended) A process as claimed in ~~any one of the preceding claims, characterized in that~~ claim 1, wherein the solution enriched in xylose and recovered as the nanofiltration permeate also includes other pentose sugars.

Claim 40 (Currently Amended) A process as claimed in claim 39, ~~characterized in that said~~ wherein the other pentose sugars comprise arabinose.

Claim 41 (Currently Amended) A process as claimed in ~~any one of claim[[s]] 2 to 40, characterized in that~~ wherein said hexoses recovered in the nanofiltration retentate comprise one or more of glucose, galactose, rhamnose and mannose.

Claim 42 (Cancelled)

Claim 43 (New) A process as claimed in claim 3, wherein the xylose content of the xylose solution is over 1.5 times that of the hydrolysate, based on dry substance content.

Claim 44 (New) A process as claimed in claim 43, wherein the xylose content of the xylose solution is over 2.5 times that of the hydrolysate, based on dry substance content.

Claim 45 (New) A process as claimed in claim 3, further comprising recovering a xylose-solution having a xylose content of over 1.5 to 2.5 time that of the hydrolysate, based on dry substance content.

Claim 46 (New) A process as claimed in claim 5, wherein the dry substance content of the hydrolysate is 8 to 25% by weight.

Claim 47 (New) A process as claimed in claim 7, wherein the hydrolysate has a xylose content of 15 to 55% by weight, based on the dry substance content.

Claim 48 (New) A process as claimed in claim 7, wherein the hydrolysate has a xylose content of 15 to 40% by weight, based on the dry substance content.

Claim 49 (New) A process as claimed in claim 7, wherein the hydrolysate has a xylose content of 15 to 55% by weight, based on the dry substance content.

Claim 50 (New) A process as claimed in claim 15, wherein the nanofiltration is carried out at a pH of 3 to 6.5.

Claim 51 (New) A process as claimed in claim 50, wherein the nanofiltration is carried out at a pH of 5 to 6.5.

Claim 52 (New) A process as claimed in claim 16, wherein the nanofiltration is carried out at a pressure of 15 to 35 bar.

Claim 53 (New) A process as claimed in claim 17, wherein the nanofiltration is carried out at a temperature of 30 to 60 °C.